Amendments to the Abstract:

ABSTRACT OF THE DISCLOSURE

The present invention relates to a method for manufacturing composite polymer electrolyte membranes coated with inorganic thin films for fuel cells using a plasma enhanced chemical vapor deposition (PECVD) method or a reactive sputtering method, so as to reduce the crossover of methanol through polymer electrolyte membranes for fuel cells and enhance the performance of the fuel cells. A surface of the membrane can be coated with inorganic thin films made of inorganic materials, such as silicon oxide (SiO_2), titanium oxide(TiO_2), zirconium oxide (ZrO_2), zirconium phosphate ($Zr(HPO_4)_2$), zeolite, silicalite, or aluminum oxide (Al_2O_3), so as to make a composite polymer electrolyte membrane. A plasma enhanced chemical vapor deposition method or reactive sputtering method can be used to coat a surface of the membrane with the inorganic thin films.

~~The manufacturing method of composite polymer electrolyte membranes coated with inorganic thin films for fuel cells according to the present invention is characterized to obtain composite membranes by coating the surface of commercial composite polymer electrolyte membranes for fuel cells with inorganic thin films using a PECVD method or a reactive sputtering method. The inorganic materials to form the inorganic thin films are chosen one or more from the group comprising silicon oxide (SiO_2), titanium oxide(TiO_2), zirconium oxide (ZrO_2), zirconium phosphate ($Zr(HPO_4)_2$), zeolite, silicalite, and aluminum oxide (Al_2O_3).~~

~~The present invention, by coating the polymer electrolyte membranes for fuel cells with~~

~~inorganic thin films via a PECVD method or a reactive sputtering method, reduces the methanol crossover sizably without seriously reducing the ionic conductivity of polymer electrolyte membranes, thereby, when applied to fuel cells, realizes a high performance of fuel cells.~~